



REMARKS

Reconsideration of this application is respectfully requested in view of the following remarks.

Claims 8-12, 14, and 15 have been withdrawn. Claim 16 is currently pending in the present application and subject to examination.

I. Rejections Under 35 U.S.C. § 112

In the Office Action mailed April 6, 2006, the Examiner rejected claim 16 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement for not discussing a threshold voltage of the MOS transistor being substantially equal to that of an MOS transistor having a silicon oxide film without Kr. The Examiner rejected claim 16 under 35 U.S.C. § 112, second paragraph, as being indefinite. The Applicant respectfully traverses these rejections as follows.

The Applicant submits that page 23, lines 1-14 and figure 14 disclose this feature of the present invention. Figure 14 shows the threshold voltage of the Kr/O₂ plasma oxide film essentially mirroring that of the thermal oxide film (described on page 23 as a conventional gate oxide film formed by using about 900°C thermal oxidation).

On page 1, second paragraph, the specification explains that conventional oxide formation used thermal oxidation at or above 800°C, and on page 2, paragraph 3, the specification explains that when conventional thermal oxidation could not be used, a metallic material must be introduced in order to give the same ultrahigh speed elements. The specification further describes, on page 2, paragraph 3, that the metal deteriorates the operation performance of the elements when a high temperature process of 550°C or more is used. Thus, the specification consistently uses the

description of conventional thermal oxide film formed at high temperatures to mean silicon oxide films not containing a metal.

In figure 14 the threshold voltage is the gate voltage when the drain current is 1 μ A (or 10^0). As is apparent from Figure 14 and the description on page 23, lines 1-14, the threshold voltage for both the Kr/O₂ plasma oxide film and the conventional thermal oxide film (which does not contain a metal, as described above) are the same.

Thus, the Applicant submits that the specification fully supports and defines the claimed limitation of the threshold voltage of the MOS transistor being substantially equal to that of an MOS transistor having a silicon oxide film without Kr. Thus, the Applicant requests that the rejections under §112, first and second paragraph be withdrawn.

II. Rejections Under 35 U.S.C. § 102(b)

The Examiner rejected claim 16 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,027,320 to Jacobs. The Applicant respectfully traverses this rejection.

Applicant's invention, as set forth in claim 16, is directed to an MOS transistor having a silicon semiconductor portion for its channel region, a silicon oxide formed on the silicon semiconductor portion, wherein the silicon oxide film contains Kr and a threshold voltage of the MOS transistor is substantially equal to that of an MOS transistor having a silicon oxide film without Kr.

Jacobs teaches a silicon oxide film containing Kr. However, the transistor containing the silicon oxide film of Jacobs does not have a threshold voltage substantially equal to that of an MOS transistor having a silicon oxide film without Kr.

In Jacobs, Kr is implanted into the gate silicon oxide film. Lattice defects are then formed and electrons or holes are trapped therein, creating a memory function. The threshold voltage of the transistor shifts to positive or negative by the trapped electrons or holes. This makes it possible to determine from the outside whether information is already stored. For examples, if 10^{11} lattice defects are formed, the threshold voltage varies by 0.5V. Accordingly the threshold voltage of the transistor in Jacobs is not equal to that of a silicon oxide film without Kr.

For at least this reason, the Applicant submits that claim 16 is allowable over the cited art.

CONCLUSION

For all of the above reasons, it is respectfully submitted that the claims now pending patentability distinguish the present invention from the cited references. Accordingly, reconsideration and withdrawal of the outstanding rejections and an issuance of a Notice of Allowance are earnestly solicited.

Should the Examiner determine that any further action is necessary to place this application into better form, the Examiner is encouraged to telephone the undersigned representative at the number listed below.

In the event this paper is not considered to be timely filed, the Applicants hereby petition for an appropriate extension of time. The fee for this extension may be charged to our Deposit Account No. 01-2300. The Commissioner is hereby

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authorized to charge any fee deficiency or credit any overpayment associated with
this communication to Deposit Account No. 01-2300, with reference to Attorney
Docket No. 108390-00056.

Respectfully submitted,

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